C191-E001E

SHIMADZU
Excellence in Science

Chromatopac Data Processor for Chromatography

C-R8A

Enhanced data processing functions in a compact unit

The data processing functionality of the highly-acclaimed Chromatopac line is now even more advanced. The superior C-R8A Chromatopac Data Processor is equipped with improved automated validation functions and network compatibility.

Inherits the proven Shimadzu Chromatopac algorithms

The numerous peak processing functions and quantitative calculations from previous models (C-R4A, C-R5A, C-R7A) are included in the C-R8A.

Includes automated validation functions

The hardware validation software (accessed with the VP key) supports GLP/GMP and ISO requirements.

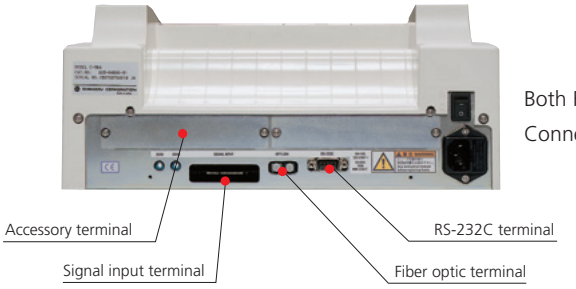
Supports full network capability

The C-R8A includes a high speed RS-232C port (19,200 bps) as standard for networking through CLASS-Agent and Chromatopac Manager software programs.

Designed for universal applications

Both novices and experts can make full use of the C-R8A's considerable functionality.

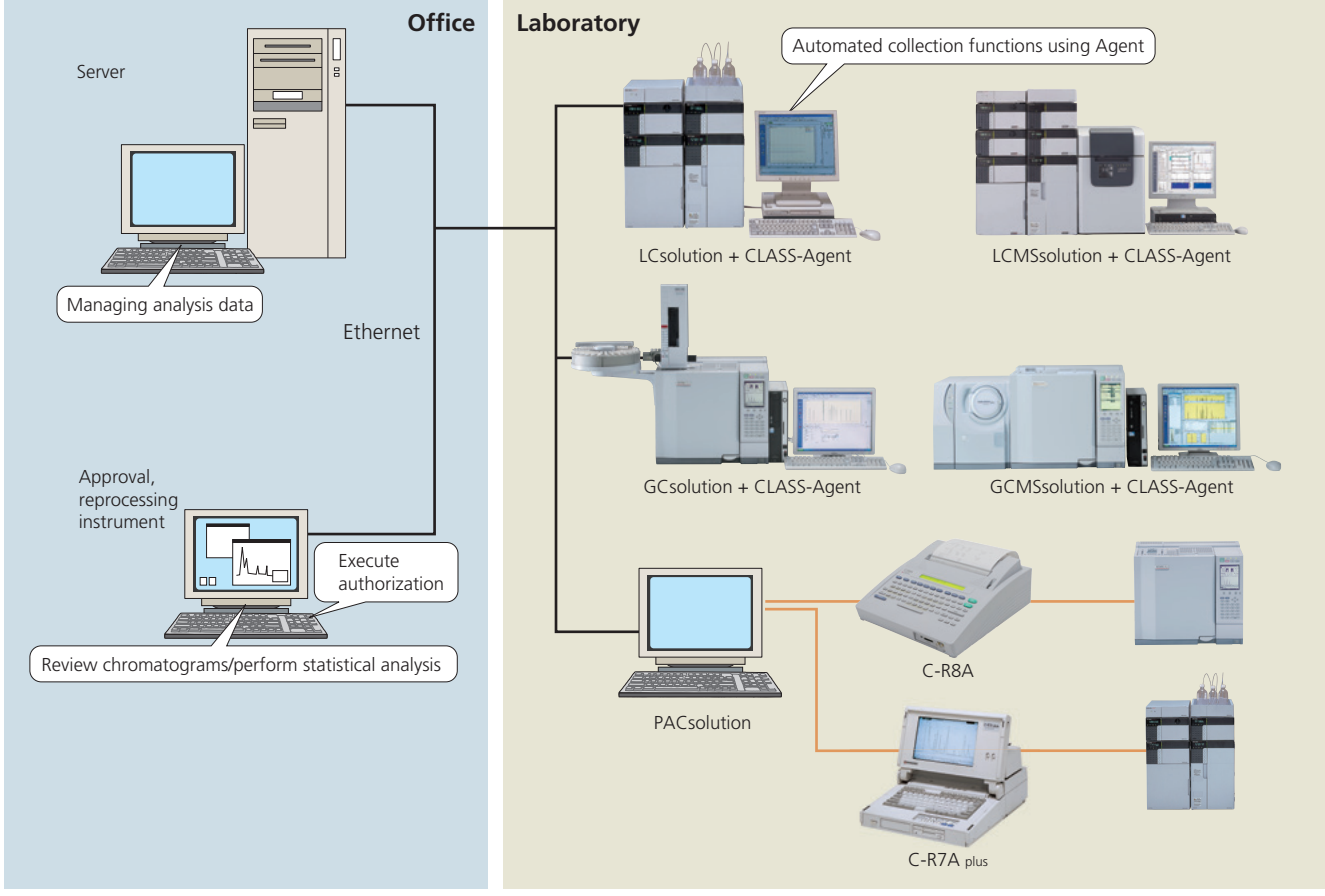
Flexibly accommodates both stand-alone and networked systems



Both RS-232C and fiber optic interfaces (one each) are provided as standard equipment. Connection to a PC and to analytical instruments is easily accomplished.

SD card drive is offered as standard equipment.

PC Network Configuration Example

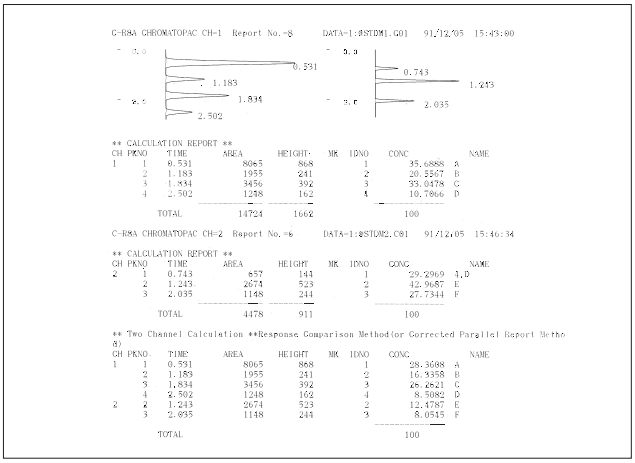


Features

Basic Functions

The renowned Chromatopac data processing functions have now been further enhanced

- The Chromatopac's peak processing and quantitation algorithms are pivotal to all C-R8A functions. This real-time, multitasking operating system ensures both the unerring acquisition of broad or sharp peaks as well as the accurate and precise calculation of peak area and retention time.
- Asynchronous data processing can be performed on up to 2 channels.



C-R8A CHROMATOPAC CH=1 Report No.=8 DATA=1:@STDM1.G01 91/12/05 15:43:00

0.531
1.183
1.834
2.502

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	1	0.531	8065	868		1	35.6888	A
	2	1.183	1955	241		2	20.5367	B
	3	1.834	3456	392		3	33.0478	C
	4	2.502	1248	162		4	10.7866	D
	TOTAL		14724	1662			100	

C-R8A CHROMATOPAC CH=2 Report No.=6 DATA=1:@STDM2.C01 91/12/05 15:46:34

0.743
1.243
2.035

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
2	1	0.743	857	144		1	29.2969	A,D
	2	1.243	2674	523		2	42.9687	E
	3	2.035	1148	244		3	27.7344	F
	TOTAL		4478	911			100	

** Two Channel Calculation **Response Comparison Method(or Corrected Parallel Report Method)

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	1	0.531	8065	868		1	28.3688	A
	2	1.183	1955	241		2	16.3358	B
	3	1.834	3456	392		3	26.2621	C
	4	2.502	1248	162		4	8.5082	D
2	2	1.243	2674	523		2	12.4787	E
	3	2.035	1148	244		3	8.0515	F
	TOTAL						100	

Ease of Operation

Operation is easy with a 2-level menu and Navigation Help

- Switch from a Typical menu displaying the minimum required analysis parameters to a Detailed menu, containing advanced settings. Perform only the operations necessary for the analytical requirements.
- A newly added Navigation Help feature greatly eases the learning curve for quick mastery of the operations.

Menus contain different analysis parameter levels

Basic Menu
Peak Processing Parameters
Quantitation Parameters
ID Table

Detailed Menu
Peak Processing Parameters
Quantitation Parameters
ID Table
Comment
Time Program
Event Program
Option Parameters
Plot Parameters
Report Parameters
Multi Standards

Data Storage

Increased main unit memory capacity, SD card drive and high performance AF paper printer — all standard

- With greatly increased internal memory (1 MB over the previous model) and a SD card* disk drive, all data can be easily stored. Naturally, all data from previous Chromatopac models can be read.
- In addition to economical thermal paper, the printer also supports the use of AF (Anti-Fade) paper, which can be stored without fading for at least 20 years.

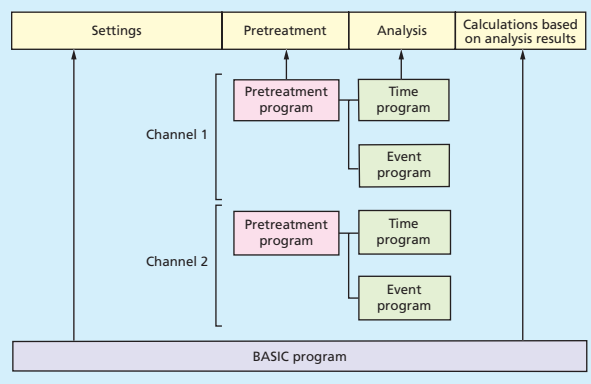
* In case of using normal SD card, format of SD card is required with the supplied software.

Automation

Analysis can be further automated with Chromatopac BASIC programming

- Using Chromatopac BASIC programs, a wide range of system functions can be automated, such as: controlling peripheral accessories, monitoring the instrument status, performing calculations based on analysis results, creating analysis reports, and transmitting data to a higher level PC.
- Passwords can be used to lock analysis files or BASIC programs.
- Switch between sampling lines with a pretreatment program, and control external accessories prior to the start of analysis.

Configuration of user program



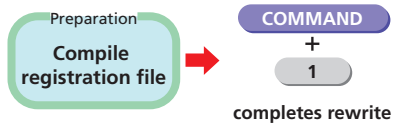
Convenient Functions

The C-R8A is loaded with useful functions, including continuous automated reprocessing and keyboard history

Continuous Reprocessing

Command Allocation

Command Allocation example:
rewrite an analysis file at the touch of a key



- The C-R8A comes with a wide variety of convenient functions, such as continuous automated reprocessing of acquired data, recall of previous keyboard entries, and access to a keyboard history of editing operations.
- Using the Command Allocation function, up to 20 BASIC commands can be assigned to the keyboard numeric keys, for the simplest command execution.

Documentation

Basic Operation Manual, Pocket Reference and detailed User's Manual on CD-ROM all included

- Operational procedures, as well as the many functions, are thoroughly explained in the Basic Operation Manual and the detailed User's Manual on CD-ROM*. The Pocket Reference serves as a convenient guide when detailed procedures are not required.
- The CD-ROM allows keyword searches for the fast, easy location of functions.

* PDF file format: requires appropriate reader program

Enhanced automated validation functions facilitate regulatory compliance

VP key provides validation support

System Information

One-touch access to system program version information, instrument serial number, validation results.

Operation Log

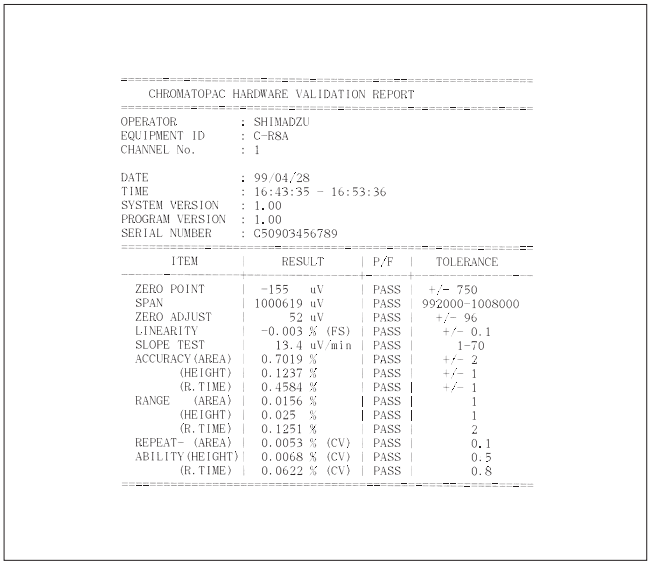
Displays the operating status of each channel (analysis status, BASIC program/Event program/Pretreatment program operation status), and keeps a log of keyboard operations.

Error Log

If an error is generated, it is recorded in the instrument log so you can determine the appropriate remedial measures.

Hardware validation support

The C-R8A includes hardware validation software, which is easily executed using a preset procedure. The validation results which can be recorded in the instrument are compiled in a fixed report format for simple verification and storage.



CHROMATOPAC HARDWARE VALIDATION REPORT

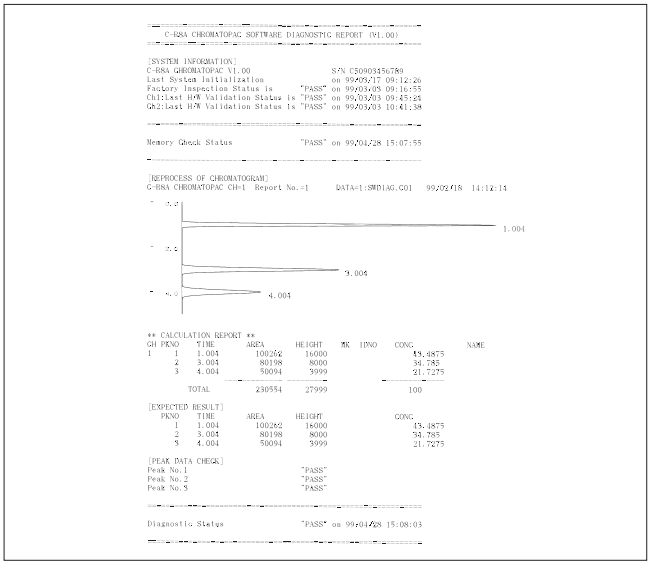
OPERATOR : SHIMADZU
EQUIPMENT ID : C-R8A
CHANNEL No. : 1

DATE : 99/04/28
TIME : 16:43:35 - 16:53:36
SYSTEM VERSION : 1.00
PROGRAM VERSION : 1.00
SERIAL NUMBER : C50903456789

ITEM	RESULT	P/F	TOLERANCE
ZERO POINT	-155 uV	PASS	+/- 750
SPAN	1000619 uV	PASS	992000-1008000
ZERO ADJUST	52 uV	PASS	+/- 96
LINEARITY	-0.003 % (FS)	PASS	+/- 0.1
SLOPE TEST	13.4 uV/min	PASS	1-70
ACCURACY (AREA)	0.7019 %	PASS	+/- 2
(HEIGHT)	0.1237 %	PASS	+/- 1
(R.TIME)	0.4584 %	PASS	+/- 1
RANGE (AREA)	0.0156 %	PASS	1
(HEIGHT)	0.025 %	PASS	1
(R.TIME)	0.1251 %	PASS	2
REPEAT- (AREA)	0.0053 % (CV)	PASS	0.1
ABILITY (HEIGHT)	0.0068 % (CV)	PASS	0.5
(R.TIME)	0.0622 % (CV)	PASS	0.8

Software validation support

The C-R8A incorporates software validation functionality. Basic validation is executed by simply selecting a menu item. These validation results are also compiled in a fixed report format, allowing for simple verification and storage.



C-R8A CHROMATOPAC SOFTWARE DIAGNOSTIC REPORT (V1.00)

[SYSTEM INFORMATION]
C-R8A CHROMATOPAC V1.00 S/N C50903456789
Last System Initialization on 99/03/17 09:12:26
Factory Inspection Status is "PASS" on 99/03/03 09:16:55
Ch1:Last H/W Validation Status is "PASS" on 99/03/03 09:45:24
Ch2:Last H/W Validation Status is "PASS" on 99/03/03 10:41:38

Memory Check Status "PASS" on 99/04/28 15:07:55

[REPROCESS OF CHROMATOGRAM]
C-R8A CHROMATOPAC CH=1 Report No.=1 DATA=1:SWDIAG.C01 99/02/18 14:12:14

** CALCULATION REPORT **

GH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	1	1.004	100262	16000			43.4875	
	2	3.004	80198	8000			34.785	
	3	4.004	50094	3999			21.7275	
	TOTAL		230554	27999			100	

[EXPECTED RESULT]

PKNO	TIME	AREA	HEIGHT	CONC
1	1.004	100262	16000	43.4875
2	3.004	80198	8000	34.785
3	4.004	50094	3999	21.7275

[PEAK DATA CHECK]
Peak No.1 "PASS"
Peak No.2 "PASS"
Peak No.3 "PASS"

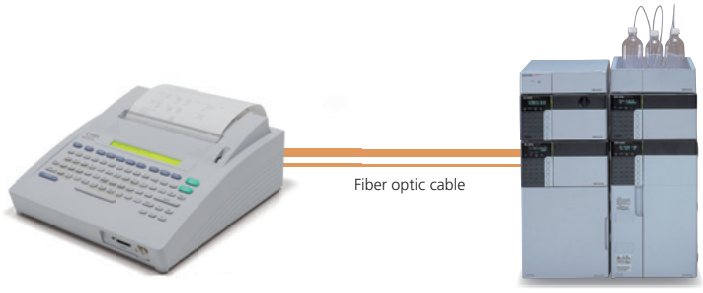
Diagnostic Status "PASS" on 99/04/28 15:08:03

System Configuration Examples

The Chromatopac C-R8A can be used in the following types of system configurations.

1 Digital link using optical cable (Processing for up to 2 channels)

Digital data transmission between the C-R8A and a system with a fiber optic cable connection (for example, SCL-10Avp) requires only the fiber optic cable. Data processing can be performed for up to 2 channels in this configuration.*



C-R8A

Instrument supporting digital link

* Only one system can be connected by digital link.
In this configuration, data processing can be conducted for either 1 channel or 2 channels simultaneously.

2 Analog signal line connection (Processing for up to 2 channels)

Conventional detectors are normally equipped with an analog output terminal, so all that is required is an analog signal line connection to the C-R8A for asynchronous data processing for up to 2 channels. In this configuration, processing for the second channel requires an optional 2-channel board.

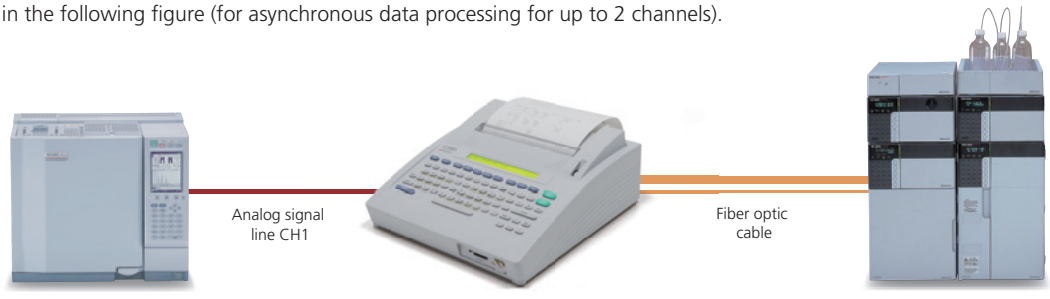
Instrument with analog signal output

C-R8A

Instrument with analog signal output

3 Connection using fiber optic cable and analog signal line (Processing for up to 2 channels)

The C-R8A comes equipped with both an analog signal output terminal and a fiber optic cable terminal, enabling the type of configuration shown in the following figure (for asynchronous data processing for up to 2 channels).



Instrument with analog signal output

C-R8A

Instrument supporting digital link

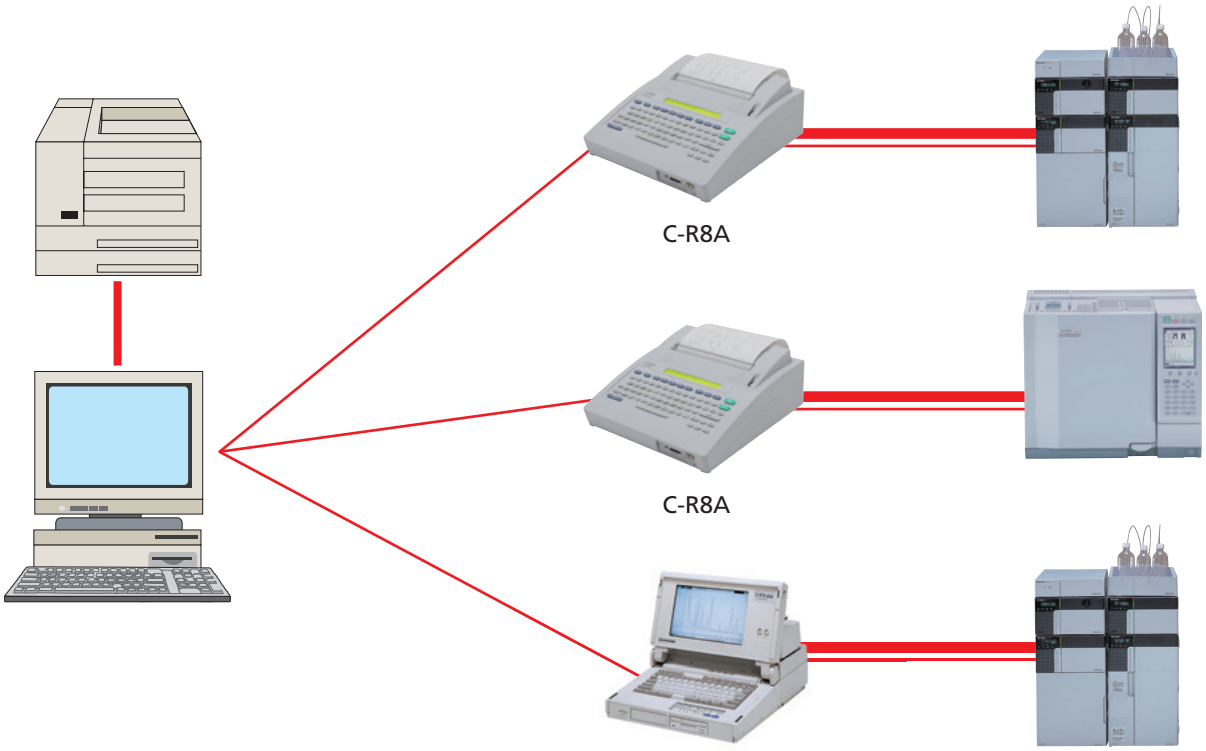
Data Management and Reprocessing using a PC

Chromatopac Manager

The C-R8A contains a high speed RS-232C board (19,200 bps). System configurations can include a PC when the Chromatopac Manager is also installed.

System Configuration Examples

One PC can be connected to up to 8 analytical systems.



Features

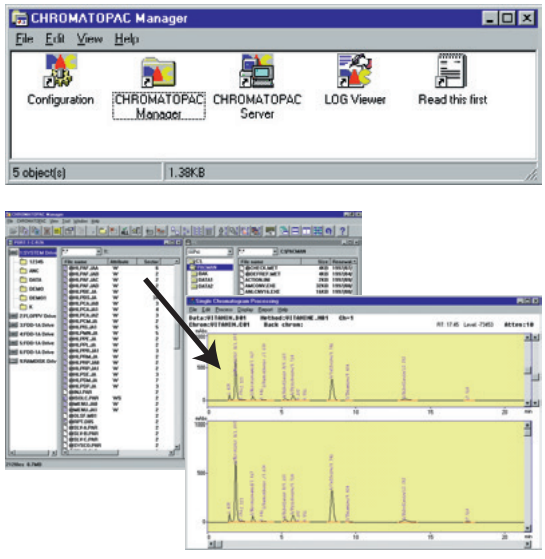
C-R8A data can be managed and re-analyzed from a PC.

Automated collection and conversion of analytical data

Data transmission to a PC is greatly facilitated. Data from the C-R8A can be automatically collected by the PC, and simultaneously converted to ASCII file format.

Data management and reprocessing from a PC

Data collected by a PC can be re-analyzed using the Chromatopac Manager software installed on the PC. The data can then be opened in commercial software applications (such as MS-Excel) for convenient report generation.

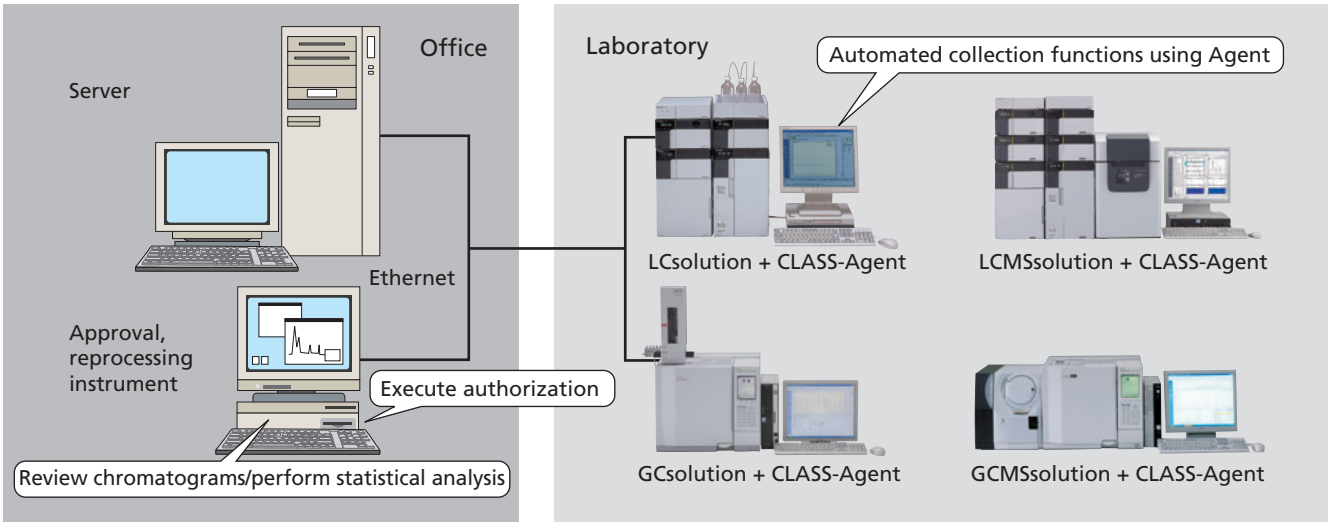


Database Management Software Simplifies Network Usage

CLASS-Agent

The CLASS-Agent database management software handles data from the C-R8A (as well as previous Chromatopac versions) over a network.

System Configuration



Features

C-R8A data, including analysis results, are efficiently managed in a database.

Analysis results automatically registered in the database

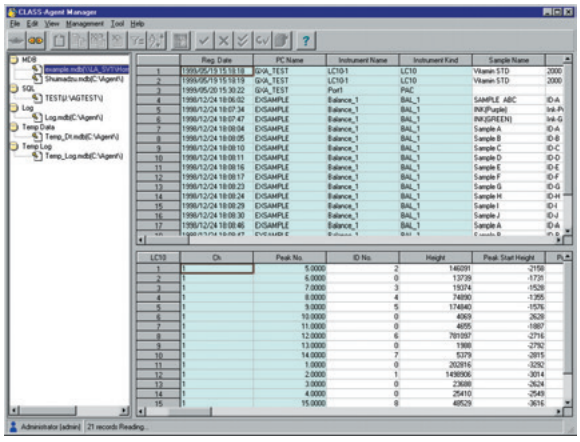
Data generated by an LC, GC, or balance are automatically collected and registered in the database, for easy management of large amounts of data.

Full data search functionality

The built-in data search functionality quickly locates desired data.

GLP/GMP support functions

Security is ensured by limiting data review according to users. Audit trail functionality is provided through automated maintenance of an operation log.



Optional Accessories

Various accessories are available for the C-R8A.

The C-R8A unit is equipped with 2 option slots for the installation of optional boards.

PC-55N
2-channel board
(223-03507-91)

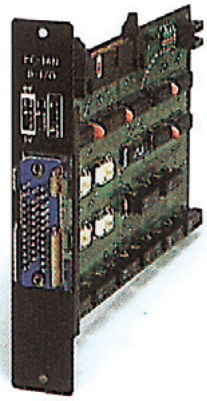
Required for performing dual channel simultaneous processing.

PC-57N
3-channel optical link interface
(223-03727-91)

Optional fiber optic link board equipped with 3 channels.

PC-16N
Digital I/O board
(221-21193-91)

Equipped with 8 digital signal inputs (input current 0.20 mA) and 8 digital signal outputs (lead relay contact point outputs), this board is used for delivering and receiving signals and for remote instrument control. Up to 4 digital I/O boards (32 inputs and 32 outputs) can be used.



PC-17NS
Interface
(223-04593-91)

Required for connection of the PRG-102A Controller.

PRG-102A*
External Instrument Controller
(221-17084-90)

Build an automated analysis system. Connect the PRG-102A to the C-R8A to control solenoid valves, gas sampling valves, backflush valves, etc., and perform operations such as automated sample injection, column switching and signal switching.
Power relay contact outputs: 5 (3 of which are designated for standard valves)
Miniature relay contact outputs: 3

*The PRG-102A requires a PC-17NS interface (2 PRG-102A units per PC-17NS).

SEL-2 Input Selector
(with remote switch)
(221-26823-90)

Connects up to 4 chromatographs at a time, selecting one of the signals for collection. It can also start a Chromatopac placed up to 5 meters away. (As there is no Stop switch, the Chromatopac must be stopped either by specifying a time with the STOP.TM command or by manually pressing the STOP key on the Chromatopac.

Specifications

Specifications

Number of input channels	Digital signal inputs: 2ch (standard) Analog signal inputs: 1ch (standard), 2ch (option)
Input voltage range	-5mV to 1V
Peak processing	Processing peak number: About 1000 max. Minimum peak width processed: 0.04 second (width at half height) Reprocessing: With different parameters. Continuous reprocessing possible.
Identification	Absolute retention time method, relative retention time method, multi-reference method, time band method, time window method, elution order method. Maximum peak number for identification: about 1000
Quantitative calculations	Area normalization method, corrected area normalization method (with or without scale factor), internal standard method, multi-internal standard method, external standard method, exponential calculation method, grouping.
Calibration curve	1-point method, 2-point method, least squares linear regression (15 points), multi-linear methods (15 points), calibration curve plot.
Disk drive	SD Drive (MicroSD, SDHC standard or higher, compliant with SPI mode) MS-DOS format 1.44 MB (2HD) ×100
Interfaces	Opt link: 1ch, RS-232C: 1ch
Option slots	2 slots
Display	LCD 40 characters × 2 lines, with back light, for key board entries and status monitors
Printer	Parallel thermal head system Chart paper: 210 mm × 50 m (roll type), 210 mm × 2000 pages (300 mm/ page, Z-folded type) Recording speed: 1 to 100 mm/min
User programs	Chromatopac BASIC, time program, event program, sample pretreatment program.
Performance	Dynamic range: 10^6 (10^8 for wide-range FID of the GC-17A) Integration sensitivity: 0.1μV × sec. Linearity: Less than 0.1% Repeatability: Coefficient of variation: 0.1% for area, less than 0.5% for height (Conditions: 1 mV peak height, 20 sec. Half value height, 1 day)
Installation Requirements	Power: AC 100 to 240 V, ±10%, 50/60 Hz, 30 VA (normal), 70 VA (maximum) Temperature: 5 to 35 ˚C Humidity: 30 to 80% (No condensation)
Dimensions and weight	W340 × D380 × H150 mm About 5 kg

Mainbody

Description	P/N
C-R8A	221-80450 -32: 120V -38: 230V

Consumables and Optional Accessories

Description	P/N
Thermal Chart Paper, Normal, 10 rolls	223-04230-81
Thermal Chart Paper, Anti-Fade type, 10 rolls	223-04231-81
Thermal Chart Paper, Normal, Z-folded type	223-04232
Thermal Chart Paper, Anti-Fade type, Z-folded type	223-04233
Formatted SD Card (1 incl.)	221-80503-91
2 slot expansion case for C-R8A	223-04592-91
Analog signal cable, 3 m (1 incl.)	221-25536-90
Fiber optic cable, 1 m	070-92025-51
Fiber optic cable, 2 m	070-92025-52
Fiber optic cable, 3 m	070-92025-53
Fiber optic cable, 5 m	070-92025-54
RS-232C Cable, 2 m	228-35397-92
RS-232C Cable, 3 m	228-35397-93
RS-232C Cable, 5 m	228-35397-95
RS-232C Cable, 10 m	228-35397-90
RS-232C Cable, 9-25pin, 2 m	228-35398-42
2-channel Board, PC-55N	223-04202-41
Optical/RS-232C Interface, PC-56N	223-02983-92
3-channel Optical-Link Interface, PC-57N	223-03727-91
Digital I/O port, PC-16N	221-21193-91
PRG-102A, Programmer	221-17084-90
Interface, PC-17NS	223-04593-91
SEL-2, Input selector	221-26823-90
6 slot expansion case for C-R8A	221-25541-90
Analog Cable, Wide PLUS	221-47251-41
Analog Cable, Linear PLUS	221-47251-42
Code, C-R3A～GC-8A 3 m	221-26918-91
R8A Template for R5A/R6A	221-80501-91

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